Space Weather Forecast

Issued on Sunday, 16 April 2023 at 00:13 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Moderate-class X-ray flares (R1-R2 Minor-Moderate radio blackouts), slight chance of Strong-Class flares (R3 strong radio blackouts) throughout.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low over the past 24 hours, but with persistent Common-class activity observed from regions across the visible disk. There are 11 active regions currently with four prominent regions. Two significantly complex regions in the southeast quadrant, one in the northeast and one in the west of the disk. The remaining regions are either developing slowly, or are stable and benign. Imagery from a CME (coronal mass ejection) which left the southwest quadrant during 14 April remains under investigation, and will be analysed should sufficient data becomes available. A CME observed in the northern hemisphere approximately 15/1100UTC has been analysed and we await model data, with the potential for a glancing blow late in the period. We await imagery for two other CMEs observed in the far southwest and northwest quadrant late on the 15 April.

Solar Wind / Geomagnetic Activity: The solar wind has been at background levels throughout the period. Total magnetic field strength has been weak, with the important north-south component also varying weakly. Geomagnetic activity was Quiet to Unsettled through the period.

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is forecast to be Low to Moderate, with isolated to occasional Moderate-class flares (R1-R2 Minor-Moderate radio blackouts) likely. There is also a slight chance of isolated Strong-class flares (R3 Strong radio blackouts).

Solar Wind / Geomagnetic Activity: A CME which left the Sun on 12 April may glance the Earth on 16 April, but with low confidence. Earth is expected to experience generally Slow-Ambient background solar wind conditions, though some slight transient enhancement possible from glancing coronal hole influence. Geomagnetic activity is expected to remain Quiet to Unsettled, with a chance of Active and a slight chance of G1/Minor Storms on day 1 (16 Apr) due to the possible CME glance.

Energetic Particles / Solar Radiation: Solar radiation storms are not expected and should remain at background levels, although there is a slight chance of a greater than S1 event as some of the more complex active regions transit towards the western solar hemisphere, where they are more likely to connect with the Earth.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	5	1	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	60	60	60	60
Very Active	R3 to R5 X	No	10	10	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	10	10
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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